

CLAIMS

1. A dimming device in a display that utilizes a fly's eye lens array that comprises an array of lenses, the dimming device comprising:  
  
at least one moveable attenuator, the at least one moveable attenuator configured to form a plurality of apertures that can be controllably opened and closed, each of the plurality of apertures corresponding to at least one lens of the array of lenses in the fly's eye lens array to selectively attenuate light transmission through the at least one lens.
2. The dimming device of claim 1 wherein the at least one moveable attenuator comprises a plurality of slats.
3. The dimming device of claim 1 wherein the at least one moveable attenuator comprises a plurality of slats, and wherein the plurality of slats are positioned between lenses in the array of lenses when the dimmer is in a bright state and wherein they are movable to block light in the dark state.
4. The dimming device of claim 1 wherein the at least one moveable attenuator comprises a first moveable attenuator and a second moveable attenuator.
5. The dimming device of claim 4 wherein the first moveable attenuator and the second moveable attenuator are configured to move in opposite directions to close the plurality of apertures.

6. The dimming device of claim 1 wherein the at least one moveable attenuators comprise an attenuation profile that determines a ratio of attenuator movement to change in a light throughput.
7. The dimming device of claim 6 wherein the attenuation profile is determined at least in part by a plurality of shapes in the at least one moveable attenuator.
8. The dimming device of claim 7 wherein the plurality of shapes comprises one shape for each lens in the array of lenses.
9. The dimming device of claim 7 wherein the plurality of shapes comprises V-shapes.
10. The dimming device of claim 7 wherein the plurality of shapes comprises curved shapes.
11. The dimming device of claim 7 wherein the plurality of shapes comprises compound V-shapes.
12. The dimming device of claim 6 wherein the attenuation profile is determined at least in part by a plurality of partial attenuator structures in the at least one moveable attenuator.
13. The dimming device of claim 12 wherein the plurality of attenuator structures comprises a plurality of filters.

14. The dimming device of claim 13 wherein the plurality of filters comprises a plurality of neutral density filters.

15. The dimming device of claim 13 wherein the plurality of filters comprises a plurality of halftone patterns.

16. The dimming device of claim 15 wherein the plurality of halftone patterns comprise a pattern having different frequency components than a halftone pattern on a second attenuator.

17. A dimming device in a display that utilizes a fly's eye homogenizer that comprises a first array of lenses and a second array of lenses, the first array of lenses focusing a plurality of light beams on the second array of lenses, the dimming device comprising:
- a first attenuator positioned proximate the first array of lenses and the second array of lenses, the first attenuator comprising a first plurality of slats, the first plurality of slats positioned between light beams in the plurality of light beams;
- a second attenuator positioned proximate the first array of lenses and the second array of lenses, the second attenuator comprising a second plurality of slats, the second plurality of slats positioned between light beams in the plurality of light beams, wherein the first attenuator and the second attenuator form a plurality of apertures, and wherein the second attenuator is movable such that the second plurality of slats is moveable to close the plurality of apertures and block at least a portion of the plurality of light beams to selectively attenuate light transmission through the at least one lens.
18. The dimming device of claim 17 wherein the first attenuator is moveable such that the first plurality of slats is moveable to close the plurality of apertures.
19. The dimming device of claim 17 wherein the second plurality of slats has an attenuation profile that determines a ratio of attenuator movement to change in light throughput.
20. The dimming device of claim 19 wherein the attenuation profile is determined at least in part by a plurality of shapes in the second plurality of slats.
21. The dimming device of claim 20 wherein the plurality of shapes comprise V-shapes.

22. The dimming device of claim 20 wherein the plurality of shapes comprise compound V-shapes.
23. The dimming device of claim 20 wherein the plurality of shapes comprises curved shapes.
24. The dimming device of claim 20 wherein the plurality of shapes comprise at least one shape for each of the lenses in the second lens array.
25. The dimming device of claim 19 wherein the attenuation profile is determined at least in part by a plurality of partial attenuator structures in the second plurality of slats.
26. The dimming device of claim 25 wherein the plurality of partial attenuator structures comprises neutral density filters.
27. The dimming device of claim 25 wherein the plurality of partial attenuator structures comprises halftone patterns.
28. The dimming device of claim 27 wherein the halftone patterns comprise a pattern having different frequency components than a halftone pattern on the first plurality of slats.

29. The dimming device of claim 19 wherein the attenuation profile is determined at least in part by a plurality of shapes in the second plurality of slats and a plurality of partial attenuator structures adjacent the plurality of shapes in the second plurality of slats.

30. A dimming device in a display, the dimming device comprising:

a moveable attenuator, the moveable attenuator controllable to open and close an aperture to selectively vary light transmission throughput through the display, the moveable attenuator including at least one compound V-shape edge, the at least one compound V-shape edge configured to provide a first dimming mode and a second dimming mode, where the first dimming mode provides a first ratio of moveable attenuator movement to light transmission throughput change and wherein the second dimming mode provides a second ratio of moveable attenuator movement to light transmission throughput change.

31. The dimming device of claim 30 wherein the moveable attenuator further comprises at least one partial attenuator structure.

32. A dimming device in a display, the dimming device comprising:  
a moveable attenuator, the moveable attenuator controllable to open and close an aperture to selectively vary light transmission throughput through the display, the moveable attenuator including at least one partial attenuator structure configured to decrease light transmission throughput change relative to movement of the moveable attenuator as the aperture is moves from open to closed.

33. The dimming device of claim 32 wherein the partial attenuator structure comprises neutral density filters.

34. The dimming device of claim 32 wherein the partial attenuator structure comprises halftone patterns.

35. The dimming device of claim 34 wherein the halftone patterns comprise patterns having different frequency components.